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Patentanmeldung Nr. Patent application No. Demande de brevet n°
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Blatt 2 der Bescheinigung
Sheet 2 of the certificate
Page 2 de l'attestation

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Method and devices to transmit and display audio and/or video information consisting of primary programs and commercials

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Methods and devices to transmit and display audio and/or video information consisting of primary programs and commercials

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The invention relates to methods to transmit, receive, put out and/or display audio and/or video information divided into primary and secondary/tertiary programs (commercials), and a device to execute these methods. Moreover, the invention relates to methods to transmit, receive, put out and/or display audio and/or video information divided into primary and secondary information (commercials), and a device to execute these method.

Information that is broadcasted on television or radio may often be divided into primary and secondary information or programs, i.e., connected pieces of information, according to its contents and the relevance it has for a consumer. Typically, primary information is what the consumer really wants to view or listen to, and secondary information is additional information like commercials, traffic announcements, stock news, weather news or the like. Primary and secondary information is generally transmitted in an alternating sequence, and it is displayed in that sequence, too. This gives the consumer no choice regarding the timing of the secondary information or programs. Therefore, secondary information often appears at unfavourable times.

US 5,333,091 discloses a video cassette recorder (VCR) that may be used to record a transmission. During recording, the VCR tries to detect the start and end of commercials (secondary information) and leaves corresponding time marks on the tape. During playback of the tape, the VCR switches into a fast scan mode from each start of a commercial to its end. The commercial may thus be skipped. However, there is no way to influence the occurrence of commercials online during transmission.

WO 97/36424 discloses a method to display advertising information during the time a video channel is changed on a display. The advertising must be broadcasted to the display station in advance and stored there to be available at the time a channel is changed.

A display station with a circular buffer is disclosed in US 5,371,551. Transmitted audio and/or video information is continuously stored in the buffer and forwarded from the buffer to a display. Due to the storage of transmitted information in the buffer, the user is able to execute forward and backward jumps on the information in a limited degree allowing him to skip undesirable secondary information like commercials. However,

the application of this procedure requires that the user watches the transmitted information with a certain delay that guarantees the existence of information already stored in buffer that can be the target of a forward jump. Moreover, commercials are totally excluded in this way though they are of benefit for the consumer, too, because they can reduce the costs of producing primary programs.

Therefore, an object of the present invention was to provide a method and a device to transmit and display audio and/or video information divided into primary and secondary/tertiary programs (e.g. commercials), in which the timing of the secondary/tertiary programs is better and individually targeted with respect to the consumer.

This object is achieved by methods according to claims 1, 2, 3 and/or 10 and devices according to claims 16, 17, and/or 20.

According to one aspect of the invention, a method to transmit audio and/or video information is provided, said information being divided into primary, secondary and tertiary programs, the primary and secondary programs being transmitted as usually in an alternating sequence and the tertiary programs being transmitted in parallel to the primary and/or secondary programs. Moreover, the invention provides a method to receive these transmissions, too. With this method, the information is differentiated after reception into primary, secondary and tertiary programs according to their classification at transmission.

The invention also comprises a method to output and/or display audio and/or video information that was transmitted and received according to the methods mentioned above. The information is divided into primary, secondary and tertiary programs, and the primary and secondary programs are transmitted as usually in an alternating sequence and the tertiary programs are transmitted in parallel to the primary and/or secondary programs. During operation, the method switches between the following three modes:

(a) a "normal mode", where the primary and secondary programs are put out and/or displayed as transmitted, i.e. "in real time";

(b) a "pause mode" that can be activated by a user at any time; in this mode the output and/or display of the primary program is interrupted and tertiary programs are put out and/or displayed instead, and presently transmitted and received programs are directed to and stored in a buffer;

(c) a "resume mode" that can be activated by a user at any time during a "pause mode"; in this mode the storage of presently received programs into the buffer is continued and the output and/or display of primary programs is resumed from the point of time it was interrupted, fetching the primary programs from buffer while leaving out any

interposed secondary programs; the "resume mode" being automatically finished with a return to "normal mode" if the primary program presently put out and/or displayed from buffer ends during the "real time" transmission of the secondary program that follows this primary program in the transmission sequence.

5 In "normal mode", the method simply puts out and/or displays the alternating sequence of primary and secondary programs as predetermined by the transmission. The secondary programs may especially consist of commercials. Tertiary programs are received - but not put out or displayed - in parallel to the primary or secondary programs or both. If the user wants to have a pause during the watching of the primary program, e.g. because he
10 wants to answer a phone call, he activates the "pause mode". In the "pause mode", the output and/or display of the primary program is interrupted, but nothing of the primary program is lost because it is immediately redirected to a buffer where it is stored. Instead of the primary program, tertiary programs are displayed. Preferably, the tertiary programs consist of commercials, which in this way reach the consumer at a point of time that is chosen by the
15 consumer himself.

 If the consumer wants to continue the watching of the primary program, he deactivates the "pause mode". This results in a transition to a "resume mode", in which the display of the tertiary programs is interrupted and replaced by the output and/or display of the primary program, the latter starting from the very point of time it was interrupted for the last
20 time. The primary program is read from the buffer where it was stored since the interruption. Meanwhile, the storage of the incoming transmission of programs is continued guaranteeing that no information is lost.

 During "resume mode", no secondary programs are put out and/or displayed. This exclusion of secondary programs saves time, and thus the output and/or display of
25 primary programs from the buffer is able to catch up with the real time transmission of primary and secondary programs. Eventually, a point is reached where the primary program presently put out and/or displayed from buffer ends during the real time transmission of the secondary program that follows this primary program in the transmission sequence. At this point, a change back to "normal mode" is executed, and the output and/or display is
30 continued with the real time secondary program.

 As the secondary programs are neither put out and/or displayed during "pause mode" nor during "resume mode", it is preferred that they are not stored in buffer during these modes, saving storage this way.

If the user activates "pause mode" during the output and/or display (and transmission) of a secondary program in "normal mode", the output and/or display of this secondary program may be continued until the program is finished, and the output and/or display of tertiary programs may follow then. Alternatively, the output and/or display of the secondary program may be interrupted at once and replaced by the output and/or display of tertiary programs.

Moreover, it is obviously possible to (re)activate "pause mode" during "resume mode" without the loss of primary programs.

According to a preferred embodiment of the invention, tertiary programs are transmitted stretched over time, stored in a memory, and put out and/or displayed from that memory during "pause mode". Moreover, the audio and/or video information is preferably digitally coded. Digital coding makes it possible to transmit a tertiary program of a certain duration over a much longer period of time, i.e. "stretched". Therefore, it is possible to transmit the tertiary programs in parallel to the primary programs and secondary programs using a low bandwidth only. Due to the stretched transmission, the tertiary programs must be stored in a memory to guarantee that they can be put out and/or displayed, if desired, from that memory in real time, i.e. in "pause mode".

Of course the available memory space in the buffer is precious, and therefore parts of the buffer/memory should be designated as free as soon as the programs stored therein have been put out and/or displayed once. These parts of the buffer/memory can then be reused to store incoming transmissions, i.e. primary/tertiary programs.

According to another embodiment of the invention, the transition from "pause mode" to "resume mode" is delayed until the presently put out and/or displayed tertiary program ends. In this way it is guaranteed that a once started tertiary program, e.g. a commercial, is finished before the output and/or display of the primary program is continued.

The transmission of the primary, secondary, and tertiary programs may originate from any suitable source, e.g. from a recording device like a VCR, or from the broadcasting of a radio transmitter. Therefore, it is also possible that an original broadcasting of a radio transmitter is first recorded on a VCR or the like and then later transmitted from this device to a display station. In this case, the method according to the invention may be applied both during the original broadcasting as well as during the playback from the recording device.

Another embodiment the invention comprises a method to transmit and output and/or display audio and/or video information that is transmitted in parallel on several

channels, the information in each channel being divided into primary and secondary information. Preferably, the primary information may consist of conventional programs a user is primarily interested in, and the secondary information consists of commercials that are preferably transmitted in parallel to the primary information. The user can select one out of
5 said channels, and the primary information of the selected channel is put out and/or displayed. Moreover, the method comprises an "information mode", which is initiated each time the user has changed the selected channel, and which is finished a prescribed period of time after initiation, the secondary information being put out and/or displayed in parallel to or instead of the primary information during the information mode. If the user changes the
10 channel before the end of said period of time, a new information mode is initiated each time.

This method allows the output and/or display of additional information and especially advertising each time after the user has changed a channel. The advertising may e.g. consist of a message "This program is brought to you by XYZ". The advertising thus reaches the user at a point of time that is determined by the user himself by changing the
15 channel.

Preferably, the output and/or display of the secondary information is started only a prescribed period of time after a change of channels occurred. In this way it is guaranteed that the output and/or display only takes place if the user has decided to stay at the particular channel for a longer period of time.

20 According to a preferred embodiment of the method, the secondary information is transmitted in parallel to the primary information. It may be stretched over time, stored in a memory, and put out and/or displayed from that memory during the information mode. Moreover, the audio and/or video information is preferably digitally coded. Digital coding makes it possible to transmit secondary information of a certain
25 duration over a much longer period of time, i.e. "stretched". Therefore, it is possible to transmit the secondary information in parallel to the primary information using a low bandwidth only. Due to the stretched transmission, the secondary information must be stored in a memory to guarantee that it can be put out and/or displayed from that memory in real time if desired, i.e. during an information mode.

30 The transmission of the primary and secondary information may originate from any suitable source, e.g. from a recording device like a VCR, or from the broadcasting of a radio transmitter. Therefore, it is also possible that an original broadcasting of a radio transmitter is first recorded on a VCR or the like and then later transmitted from this device

to a display station. In this case, the method according to the invention may be applied both at the original broadcasting as well as during the playback from the recording device.

The methods described above are preferably combined. Thus, in the transmission of primary, secondary, and tertiary programs that are designated for the implementation of a "pause mode" etc., the secondary and/or tertiary programs preferably serve as secondary information for the implementation of an "information mode".

Moreover, the invention includes a receiver for audio and/or video information that is divided into primary, secondary, and tertiary programs, characterised in that it can receive and discriminate primary and secondary programs transmitted in an alternating sequence and tertiary programs transmitted in parallel to the primary and secondary programs.

The invention also includes a device for the output and/or display of audio and/or video information that is divided into primary, secondary, and tertiary programs, comprising

- (A) a receiver of the above mentioned type that can receive and discriminate primary and secondary programs transmitted in an alternating sequence and tertiary programs transmitted in parallel to the primary and secondary programs,
- (B) a buffer connected to the receiver for the intermediate storage of audio and/or video information,
- (C) an output and/or display unit connected to the receiver and the buffer for the reproduction of audio and/or video information,
- (D) a control unit connected to the receiver, the buffer, and the output and/or display unit, the control unit allowing to switch between the following modes:
 - (a) a "normal mode", where the primary and secondary programs received by the receiver are put out and/or displayed on the output and/or display as transmitted, i.e. "in real time";
 - (b) a "pause mode" that can be activated via an input by a user at any time; in this mode the output and/or display of the primary program is interrupted and tertiary programs are put out and/or displayed on the output and/or display instead, and presently transmitted programs received by the receiver are directed to and stored in the buffer;
 - (c) a "resume mode" that can be activated via an input by a user at any time during a "pause mode"; in this mode the direction and storage of presently transmitted programs received by the receiver into the buffer is continued, and the output and/or display of primary programs on the output and/or display is resumed from the point of time it was

interrupted, fetching the primary programs from the buffer while leaving out any interposed secondary programs; the "resume mode" being automatically finished with a return to "normal mode" if the primary program presently put out and/or displayed from buffer ends during the "real time" transmission of the secondary program that follows this primary
5 program in the transmission sequence.

This device is capable to implement the first methods described above. Consequently, the resulting advantages of these methods can be achieved. Moreover, the device can be modified in such ways that the preferred embodiments of the methods described above are implemented.

10 The device may especially comprise a playback unit that puts out recorded audio and/or video information that is divided into primary, secondary, and tertiary programs, the primary and secondary programs being transmitted to the receiver in an alternating sequence and the tertiary programs being transmitted to the receiver in parallel to the primary and secondary programs.

15 Moreover, the invention includes a device for the output and/or display of audio and/or video information that is transmitted in parallel over several channels, the information in each channel being divided into primary and secondary information, comprising

(A) a receiver that can receive and discriminate primary and secondary
20 information, the secondary information being preferably transmitted in parallel to the primary information,

(B) optionally a buffer for the intermediate storage of audio and/or video information,

(C) optionally a decoder that can determine if the secondary information
25 is suited for output and/or display after the change of a channel,

(D) an output and/or display unit connected to the receiver for the reproduction of the audio and/or video information,

(E) a control unit connected to the receiver, buffer, decoder, and the
30 output and/or display, the control unit allowing a user to select one out of the several channels and forwarding the primary information of the selected channel from the receiver to the output and/or display unit,

the control unit further initiating an information mode each time the selected channel is changed and finishing that information mode a prescribed period of time after initiation, the

secondary information being directed to the output and/or display in parallel or instead of the primary information during information mode.

This device is capable to implement the method described above.

Consequently, the resulting advantages of this method can be achieved. Moreover, the device
5 can be modified in such ways that the preferred embodiments of the method described above are implemented.

The device may especially comprise a playback unit that transmits recorded audio and/or video information in several selectable channels to the receiver, the information in each channel being divided into primary and secondary information.

10 The invention will now be described by way of example with reference to the accompanying drawing. The only figure schematically depicts three stages of operation with different modes ("normal", "pause", "resume") occurring in a device according to the invention for displaying audio and/or video information on a display or monitor 3. Instead of monitor 3 an output could be provided that serves as an interface to another suitable device.

15 Traditionally, primary programs P1, P2, ... and commercials (secondary programs) C1, C2, ... are broadcasted alternately, and viewers of a primary program are inevitably confronted with commercials. However, "smart" digital recording devices enable viewers to record or delay a program and skip the commercials very easily. Also the number of channels will be so large and EPG's so powerful that viewers can easily find and tune to
20 another interesting channel. On the other hand, commercials are also interesting for viewers since they can reduce the costs of watching a program. Both viewers and advertising companies benefit if these commercials are well targeted and well timed. A commercial is well timed after a program, before a program, and/or when the viewer indicates he wants to take a break and presses "pause" or "stop" on his TV/VCR/STB (remote) control. Such a
25 timing is achieved with the present invention.

In order to be able to switch to commercials at any time, commercials have to be recorded. Digital broadcast and recording makes it possible to broadcast a 25 second commercial over a much longer period of time using only limited bandwidth. The invention therefore proposes to broadcast commercials C1, C2, ... in real-time after each program (as is
30 the case traditionally) and commercials C1*, C2*, ... stretched in time (to save bandwidth) in parallel with the programs. The low-bandwidth stretched time channel will be constantly recorded in a memory 4.

The reception of primary and secondary programs P1, P2, ... C1, C2, ... in alternating sequence and the parallel reception of tertiary programs C1*, C2*, ... is

schematically shown in the dotted box that indicates the receiver 1. During "normal mode" (left part of the figure), the primary programs P1 and P2 and the secondary program C1 are forwarded from the receiver 1 directly to the display 3.

5 The storage unit 2 consists of a memory 4 for the tertiary programs and a buffer 5 for the primary programs. The tertiary programs C1*, C2*, ... are continuously stored in memory 4.

The operation of the device changes to a "pause mode" (middle part of the figure), when the user presses "pause" (at the point of time shown in the left part of the figure). In "pause mode", the immediate display of the primary program P2, of which a part
10 P2' has already been displayed, is interrupted, and the tertiary programs C1*, C2* are displayed instead. To this end, the tertiary programs are retrieved from memory 4. Meanwhile, the rest P2" of the primary program P2 and the following primary program P3 are stored in buffer 5. The secondary program C2, however, is not stored in buffer but skipped.

15 When the user presses "pause" again to indicate that he wants to continue watching of the primary program P2, the system switches to "resume mode" (right part of the figure; at the point of time shown in the middle part of the figure). In this mode, the display of primary program P2 is resumed, taking the rest P2" of this program from buffer 5. Thereafter, the following program P3 is taken from buffer 5, too. Commercial C2, C3
20 between these programs are omitted because they have not been stored. This omission of commercials C2, C3 saves time with respect to the real time transmission and reception of programs, and therefore the display of programs from buffer 5 can finally catch up with the real time transmission. If this is the case, the system switches back to the "normal mode".

In summary it can be stated that if the viewer only views the main program,
25 then he will automatically be shown commercials after each program. When the user presses "pause" during the program, then he will be shown the commercials that have been recorded until then and the program itself will be delayed. When he resumes watching, he can start where he left off and will not be shown (some of the) the commercials that are broadcasted at the end of the program. In other words: he has selected time to watch commercials.

30 The low bandwidth commercial channel during programs can also be used to insert a small commercial message, that is displayed a short while after the viewer has tuned to the channel ("This program is brought to you by"). The best timing of this message would be when the viewer decides to watch the program for a longer time. E.g., in such a method the tertiary program C1* could be displayed in parallel to the primary program P1

after the channel comprising these programs has been selected. Therefore, the invention also comprises a method to recognise secondary/tertiary programs that are suitable for display right after a change in channel or recording. If the program is recorded, the stretched-in-time commercials can also be recorded, which means that the commercials could be displayed

5 even if the program is viewed after some time or for a second time.

List of references:

1	receiver
2	storage unit
3	display
4	memory
5	buffer
P1, P2, ...	primary programs
P2', P2"	first and second part of P2
C1, C2, ...	secondary programs (commercials)
C1*, C2*, ...	tertiary programs (commercials)

CLAIMS:

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1. A method to transmit audio and/or video information, characterised in that the information is divided into primary, secondary and tertiary programs, that the primary and secondary programs are transmitted in an alternating sequence (P1, C1, P2, C2, ...) and that the tertiary programs (C1*, ...) are transmitted in parallel to these programs.

2. A method to receive audio and/or video information, characterised in that the information is transmitted in a method according to claim 1, that this information is received, and that the received information is differentiated into primary, secondary and tertiary programs.

3. A method to output and/or display audio and/or video information that is transmitted in a method according to claim 1 and received in a method according to claim 2, the method switching between the following modes:

(a) a "normal mode", where the primary and secondary programs (P1, C1, P2) are put out and/or displayed as transmitted;

(b) a "pause mode" that can be activated by a user, where the output and/or display of the primary program (P2') is interrupted and tertiary programs (C1*, C2*) are put out and/or displayed instead, and where further received primary programs (P2'', P3) are directed to and stored in a buffer (5);

(c) a "resume mode" that can be activated by a user during a "pause mode", where the direction and storage of received primary programs (P3) into the buffer is continued and the output and/or display of primary programs (P2'', P3) is resumed from where it was interrupted, fetching the primary programs from buffer while leaving out any interposed secondary programs (C2, C3), the "resume mode" being finished with a return to "normal mode" if the primary program presently put out and/or displayed from buffer ends during the transmission of the secondary program that follows this primary program in the transmission sequence.

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4. The method according to one or more of claims 1 to 3, characterised in that the tertiary programs (C1*, C2*, ...) are transmitted stretched over time, stored in a memory (4), and displayed from that memory during "pause mode".
- 5 5. The method according to one or more of claims 3 to 4, characterised in that the secondary programs (C2, C3, ...) are not stored in the buffer.
6. The method according to one or more of claims 3 to 5, characterised in that parts of the buffer (5) and/or memory (4) are designated as free as soon as the programs
10 stored therein have been put out and/or displayed.
7. The method according to one or more of claims 3 to 6, characterised in that the transition from "pause mode" to "resume mode" is delayed until the presently put out and/or displayed tertiary program ends.
15
8. The method according to one or more of the preceding claims, characterised in that the transmission of the primary, secondary, and tertiary programs originates from a recording device like a VCR, or from the broadcasting of a radio transmitter.
- 20 9. The method according to one or more of the preceding claims, characterised in that the secondary and tertiary programs (C1, ..., C1*, ...) comprise commercials.
10. A method to output and/or display audio and/or video information that is transmitted in parallel on several channels, the information in each channel being divided into
25 primary and secondary information, wherein the user can select one out of the channels and the primary information of the selected channel is put out and/or displayed, the method comprising an "information mode", which is initiated each time the user has changed the selected channel and which is finished a prescribed period of time after initiation, the secondary information being displayed in parallel to or instead of the primary information
30 during the information mode.
11. The method according to claim 10, characterised in that the secondary information is transmitted in parallel to the primary information and preferably stretched over

time, stored in a memory, and put out and/or displayed from that memory during the information mode.

12. The method according to one or more of claims 10 to 11, characterised in that the transmission of the primary and secondary information originates from a recording device like a VCR, or from the broadcasting of a radio transmitter.

13. The method according to one or more of claims 10 to 12, characterised in that the secondary information comprises commercials.

14. The method according to one or more of the claims 10 to 13, characterised in that the audio and/or video information is transmitted according to claim 1 and that the secondary information consists of secondary and/or tertiary programs.

15. The method according to one or more of the preceding claims, characterised in that the audio and/or video information is digitally coded.

16. A receiver for audio and/or video information that is divided into primary, secondary, and tertiary programs, characterised in that it can receive and discriminate primary and secondary programs (P1, ..., C1, ...) transmitted in an alternating sequence and tertiary programs (C1*, ...) transmitted in parallel to the primary and secondary programs.

17. A device for the output and/or display of audio and/or video information that is divided into primary, secondary, and tertiary programs, comprising

- (A) a receiver (1) according to claim 16,
- (B) a buffer (5) for the intermediate storage of audio and/or video information,
- (C) an output and/or display unit (3) for the reproduction of audio and/or video information,
- (D) a control unit that is adapted to allow the switching between the following modes:
 - (a) a "normal mode", where the primary and secondary programs (P1, C1, P2) are put out and/or displayed as transmitted;

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(b) a "pause mode" that can be activated by a user, where the output and/or display of the primary program (P2') is interrupted and tertiary programs (C1*, C2*) are put out and/or displayed instead, and where further received primary programs (P2", P3) are directed to and stored in a buffer (5);

5 (c) a "resume mode" that can be activated by a user during a "pause mode", where the direction and storage of received primary programs (P3) into the buffer is continued and the output and/or display of primary programs (P2", P3) is resumed from where it was interrupted, fetching the primary programs from buffer while leaving out any interposed secondary programs (C2, C3), the "resume mode" being finished with a return to
10 "normal mode" if the primary program presently put out and/or displayed from buffer ends during the transmission of the secondary program that follows this primary program in the transmission sequence.

18. The device according to claim 17, characterised in that it comprises a playback
15 unit that puts out recorded audio and/or video information that is divided into primary, secondary, and tertiary programs, the primary and secondary programs (P1, ..., C1, ...) being transmitted to the receiver in an alternating sequence and the tertiary programs (C1*, ...) being transmitted to the receiver in parallel to the primary and secondary programs.

20 19. The device according to claim 17 or 18, characterised in that it is adapted to execute a method according to one of the claims 3 to 9.

20. A device for the output and/or display of audio and/or video information that is transmitted in parallel on several channels, the information in each channel being divided
25 into primary and secondary information, comprising

- (A) a receiver that can receive and discriminate primary and secondary information, the secondary information being preferably transmitted in parallel to the primary information,
- (B) optionally a buffer for the intermediate storage of audio and/or video
30 information,
- (C) optionally a decoder that can determine if the secondary information is suited for output and/or display after the change of a channel,
- (D) an output and/or display unit for the reproduction of the audio and/or video information,

(E) a control unit that is adapted to allow a user to select one out of the channels and to forward the primary information of the selected channel from the receiver to the output and/or display unit,

- 5 the control unit further initiating an information mode each time the selected channel is changed and finishing that information mode a prescribed period of time after initiation, the secondary information being directed to the output and/or display in parallel or instead of the primary information during information mode.

21. The device according to claim 20, characterised in that it comprises a playback
10 unit that puts out recorded audio and/or video information in several selectable channels, the information in each channel being divided into primary and secondary information.

22. The device according to claim 20 or 21, characterised in that it is adapted to execute a method according to one of the claims 10 to 14.

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ABSTRACT:

Primary programs (P1, P2, ...) and commercials (= secondary programs C1, C2, ...) are transmitted alternately and, in the "normal mode" of a display system according to the invention, directly forwarded to a display (3). Tertiary programs (C1*, C2*, ...) with commercials are transmitted parallel and stretched over time, i.e. in low-bandwidth, and are continuously stored in a memory (4). When the user presses "pause" during "normal mode", then he will be shown the tertiary programs (commercials C1*, ...) that have been recorded until then, and the program (P3, ...) itself will be delayed, i.e. stored in a buffer (5). When the user resumes watching, he can start with the primary program (P3) where he left off and will not be shown (some of the) the commercials (C3, C4, ...) that are broadcasted at the end of the program.

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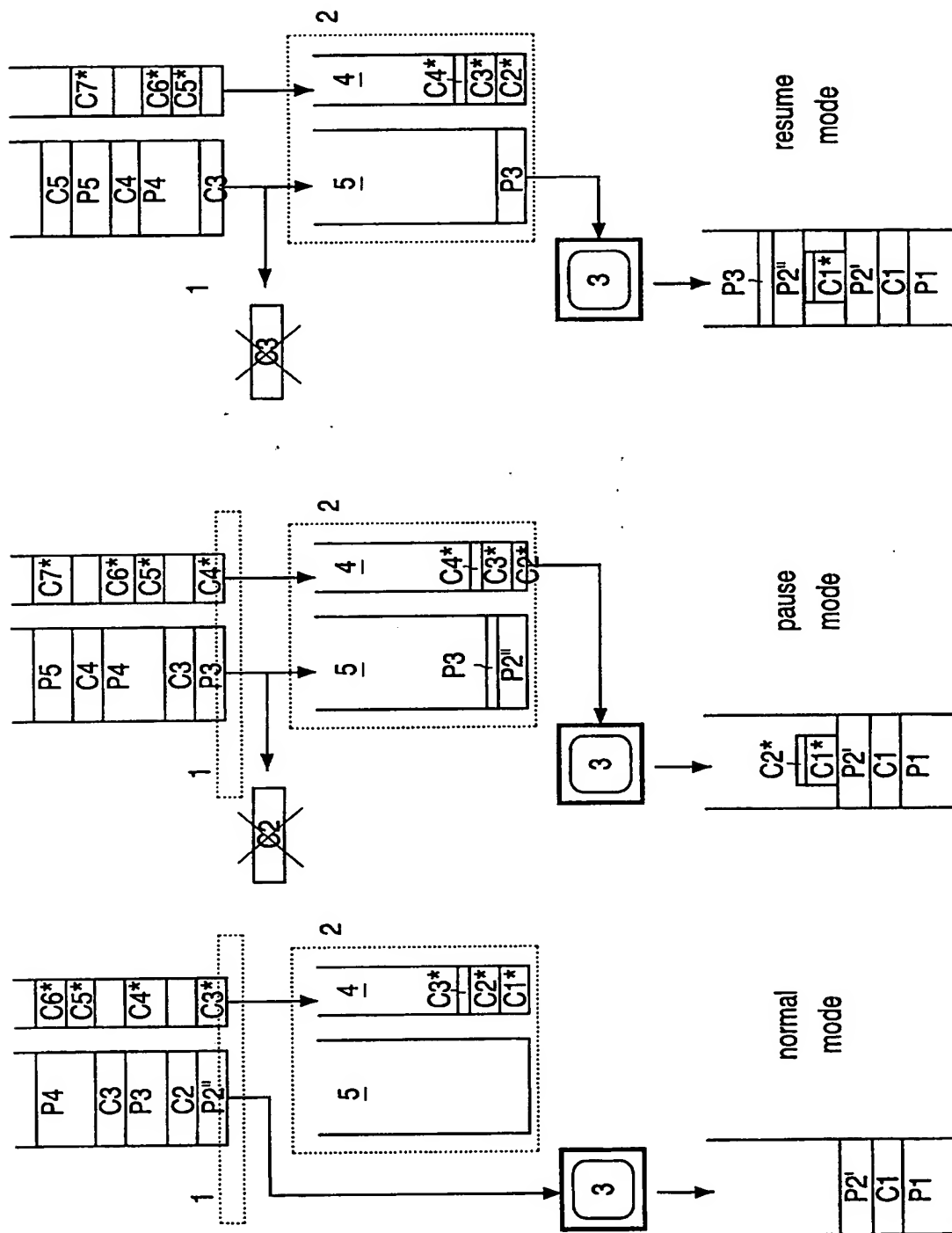
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